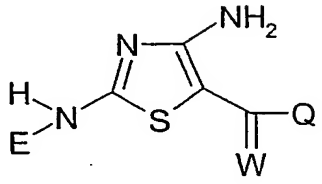
Claims

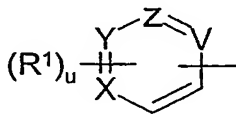
1. Use of a compound of formula (I) or an agriculturally acceptable salt thereof for plant growth regulation



(I)

wherein:

E is (C_1-C_6)alkyl, (C_2-C_6)alkenyl, (C_3-C_6)alkynyl, (C_1-C_6)alkoxy-(C_1-C_6)alkyl, [(C_1-C_6)alkoxy]carbonyl-(C_1-C_6)alkyl, [(C_1-C_6)alkyl]carbonyloxy-(C_1-C_6)alkyl, (C_3-C_8)cycloalkyl-(C_1-C_6)alkyl, furfuryl, tetrahydrofurfuryl or isoxazolyl which last mentioned group is unsubstituted or substituted with one or two (C_1-C_6)alkyl radicals; or is a group of formula (A):



(A)

in which X, Y, Z and V are each independently C or N, with the proviso that at least two of X, Y, Z and V are C;

the linking bond of (A) is attached to a ring carbon atom;

$(R^1)_u$ are u substituents of R^1 which may be same or different, each R^1 is linked to a ring carbon atom and is H, R^2, (C_3-C_8)cycloalkyl, (C_3-C_8)cycloalkyl-(C_1-C_6)alkyl, (C_3-C_8)cycloalkyl-(C_1-C_6)alkoxy, [(C_3-C_8)cycloalkyl]carbonyl, (C_3-C_8)cycloalkyloxy, (C_3-C_8)cycloalkyl-$S(O)_m$, (C_1-C_6)alkyl, (C_2-C_6)alkenyl or (C_2-C_6)alkynyl where each of the last 3 mentioned radicals is unsubstituted or substituted by one or more R^2 radicals;

or aryl, heterocyclyl, aryl-(C_1-C_6)alkyl, heterocyclyl-(C_1-C_6)alkyl, aryl-(C_1-C_6)alkoxy, heterocyclyl-(C_1-C_6)alkoxy, aryl-carbonyl, heterocyclyl-carbonyl, aryloxy, heterocyclyloxy, aryl-$S(O)_n$ or heterocyclyl-$S(O)_p$, where the aryl or

heterocyclyl portion of the last 12 mentioned radicals is unsubstituted or substituted by one to three radicals selected from the group consisting of R^2, $(C_1$-$C_6)$alkyl, $(C_2$-$C_6)$alkenyl and $(C_2$-$C_6)$alkynyl, where each of the last 3 mentioned radicals is unsubstituted or substituted by one or two R^2 radicals; or (A) is fused to a 1,3-dioxolanyl or 1,4-dioxanyl ring where each of the last two mentioned rings is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, $(C_1$-$C_6)$alkyl, $(C_1$-$C_6)$alkoxy and OH;

each R^2 independently from other R^2 radicals is hydroxy, halogen, cyano, nitro, NR^3R^4, $CONR^3R^4$, $OCONR^3R^4$, $OCH_2CONR^3R^4$, $(C_1$-$C_6)$alkoxy, $(C_1$-$C_6)$haloalkoxy, CO_2R^3, COR^3, $NHCOR^3$, $NHCO_2R^3$, $S(O)_qR^5$, SO_2NH_2 or R^6;

R^3 is hydrogen, $(C_1$-$C_6)$-alkyl or CH_2R^6;

R^4 is hydrogen or $(C_1$-$C_6)$-alkyl; or R^3 and R^4 together with the nitrogen atom to which they are attached form a 3 to 8 membered cyclic ring optionally containing one or two further hetero atoms selected from oxygen, sulfur and nitrogen;

R^5 is $(C_1$-$C_6)$alkyl or $(C_1$-$C_6)$haloalkyl;

W is O or N-OR^7;

R^6 is phenyl unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, $(C_1$-$C_6)$alkyl, $(C_1$-$C_6)$haloalkyl and $(C_1$-$C_6)$alkoxy;

R^7 is hydrogen, $(C_1$-$C_6)$alkyl or aryl-$(C_1$-$C_6)$alkyl;

Q is $(C_3$-$C_8)$cycloalkyl, $(C_3$-$C_8)$cycloalkyl-$(C_1$-$C_6)$alkyl, where the last 2 mentioned radicals are unsubstituted or substituted in the cycloalkyl by $(C_1$-$C_4)$alkyl, $(C_1$-$C_4)$alkoxy and halogen, $(C_1$-$C_6)$alkyl, $(C_2$-$C_6)$alkenyl or $(C_2$-$C_6)$alkynyl, where each of the last 3 mentioned radicals is unsubstituted or substituted by one or two R^2 radicals; or

aryl, heterocyclyl, aryl-$(C_1$-$C_6)$alkyl or heterocyclyl-$(C_1$-$C_6)$alkyl, where the aryl or heterocyclyl portion of the last 4 mentioned radicals is unsubstituted or substituted by:

i) one to three radicals selected from the group consisting of R^2, $(C_1$-$C_6)$alkyl, $(C_2$-$C_6)$alkenyl and $(C_2$-$C_6)$alkynyl, where each of the last 3

mentioned radicals is unsubstituted or substituted by one or two R^2 radicals;
or

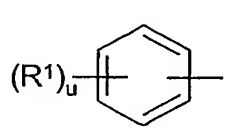
ii) $(C_3$-$C_8)$cycloalkyl, $(C_3$-$C_8)$cycloalkyl-$(C_1$-$C_6)$alkyl, $(C_3$-$C_8)$cycloalkyl-$(C_1$-$C_6)$alkoxy, [$(C_3$-$C_8)$cycloalkyl]carbonyl, $(C_3$-$C_8)$cycloalkyloxy, $(C_3$-$C_8)$cycloalkyl-$S(O)_r$, aryl, heterocyclyl, aryl-$(C_1$-$C_6)$alkyl, heterocyclyl-$(C_1$-$C_6)$alkyl, aryl-$(C_1$-$C_6)$alkoxy, heterocyclyl-$(C_1$-$C_6)$alkoxy, aryl-carbonyl, heterocyclyl-carbonyl, aryloxy, $(C_3$-$C_8)$-heterocyclyloxy, aryl-$S(O)_s$ or heterocyclyl-$S(O)_t$, which last 12 mentioned radicals is unsubstituted or substituted by one or two radicals selected from the group consisting of $(C_1$-$C_6)$alkyl, $(C_2$-$C_6)$alkenyl, $(C_2$-$C_6)$alkynyl and R^2;

m, n, p, q, r, s and t are each independently 0, 1 or 2;

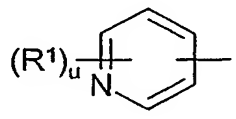
u is the number of ring carbon atoms in formula (A) minus 1;

and each heterocyclyl in the above-mentioned radicals is independently a heterocyclic radical having 3 to 7 ring atoms and 1, 2 or 3 hetero atoms in the ring selected from the group consisting of N, O and S.

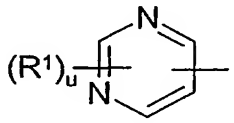
2. The use of a compound as defined in claim 1, in which (A) of formula (I) is a formula (A1), (A2), (A3), (A4) or (A5):



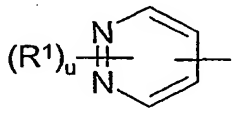
(A1)



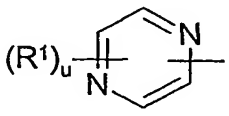
(A2)



(A3)



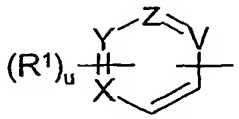
(A4)



(A5)

and wherein R^1 and u are as defined in claim 1.

3. The use of a compound as defined in claim1, in which E is $(C_1$-$C_6)$alkyl, $(C_1$-$C_6)$alkoxy-$(C_1$-$C_6)$alkyl, [$(C_1$-$C_6)$alkoxy]carbonyl-$(C_1$-$C_6)$alkyl, $(C_3$-$C_8)$cycloalkyl-$(C_1$-$C_6)$alkyl or a group (A):



(A)

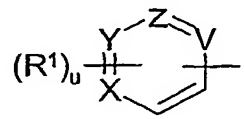
X, Y, Z and V are each C;

each R^1 which may be the same or different is H, hydroxy, halogen, cyano, nitro, NR^3R^4, $CONR^3R^4$, (C_1-C_3)alkoxy, (C_1-C_3)haloalkoxy, CO_2R^3, COR^3, $NHCOR^3$, $S(O)_qR^5$, SO_2NH_2, (C_1-C_3)alkyl or (C_1-C_3)haloalkyl, wherein R^3 and R^4 are each independently hydrogen or (C_1-C_3)-alkyl, and R^5 is (C_1-C_3)alkyl or (C_1-C_3)haloalkyl;

or phenyl or pyridyl, which last 2 mentioned radicals are unsubstituted or substituted by one to three radicals selected from the group consisting of halogen, (C_1-C_6)alkyl and (C_1-C_3)haloalkyl; and

u is 5.

4. The use of a compound as defined in claim 1, in which E is (C_1-C_3)alkyl, (C_1-C_3)alkoxy-(C_1-C_3)alkyl, [(C_1-C_3)alkoxy]carbonyl-(C_1-C_3)alkyl, (C_3-C_6)cycloalkyl-(C_1-C_3)alkyl or a group of formula (A):

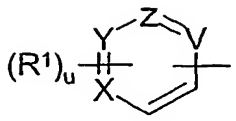


(A)

X, Y and Z are all C; V is C or N; R^1 is H or halogen; and

u is 4 or 5.

5. The use of a compound as defined in claim 1, in which E is (C_1-C_3)alkyl, (C_1-C_3)alkoxy-(C_1-C_3)alkyl, [(C_1-C_3)alkoxy]carbonyl-(C_1-C_3)alkyl, (C_3-C_6)cycloalkyl-(C_1-C_3)alkyl or a group (A):



(A)

X, Y, Z and V are all C;

W is O;

R^1 is H or halogen;

Q is cyclopropyl, $(C_1$-$C_3)$alkyl, phenyl, naphthyl, pyridinyl, tetrahydropyridinyl, thienyl or benzo[b]thienyl, which last 6 mentioned radicals are unsubstituted or substituted by one to three radicals selected from the group consisting of halogen, $(C_1$-$C_3)$alkyl, OH, NO_2, $(C_1$-$C_3)$alkoxy, $(C_1$-$C_3)$haloalkoxy, phenyl and benzyloxy; and

u is 5.

6. A composition for plant growth regulation, which comprises one or more compounds of formula (I) as defined in anyone of claims 1 to 5 or an agriculturally acceptable salt thereof, carriers and/or surfactants useful for plant protection formulations.

7. The composition as claimed in claim 6 , which comprises a further active compound selected from the group consisting of acaricides, fungicides, herbicides, insecticides, nematicides or plant growth regulating substances not identical to compounds defined by formula (I) of claim 1.

8. The use of a composition as claimed in anyone of claims 6 to 7 for plant growth regulation, in which the plant is a monocotyledoneous or dicotyledoneous crop plant.

9. The use as claimed in claim 8, wherein the plant is selected from the group consisting of wheat, barley, rye, triticale, rice, maize, sugar beet, cotton, or soybeans.

10. A method for growth regulation in crop plants, which comprises applying an effective amount of a compound of formula (I) as defined in claims 1 to 5 to the site where the action is desired said method comprising applying to plants, to seeds from which they grow or to the locus in which they grow, a non-phytotoxic, effective plant growth regulating amount of one or more compounds of formula (I).

11. A method as claimed in claim 10 that results into a yield increase of at least 10% concerning the plants to which it is applied.